

EFFECT OF THE SUPPLY OF OXYGEN ON THE HEALING SKIN WOUND AND THE EXPERIMENTAL GRANULOMA

J. Niinikoski, K. Juva and E. Kulonen

Department of Medical Chemistry, University of Turku, Finland

Viscose cellulose-sponges (four pieces, $20 \times 10 \times 10$ mm each) were implanted subcutaneously in the backs of adult male Wistar rats (about 200 g), which were kept for ten days in normobaric oxygen-nitrogen mixtures containing 12, 18, 35 or 70 % O_2 . The rats were killed and the tensile strength of the healing skin wounds (g/cm) and the granulomas (g/cm²) was determined (Viljanto, J.: Acta Chir. Scand., Suppl. 333, 1964).

The following results were obtained (\pm s.e.m.)

12 % O_2 , w 336.2 ± 25.6 (23); g 43.8 ± 3.9 (23);
 18 % O_2 , » 431.3 ± 32.8 (29); » 107.2 ± 9.7 (23);
 35 % O_2 , » 534.0 ± 22.8 (40); » 190.2 ± 18.5 (26);
 70 % O_2 , » 574.1 ± 32.9 (24); » 221.8 ± 24.6 (26).

w = in wounds; g = in granulomas

The numbers of the rats are indicated in the parentheses. The variances between the groups were larger than within the groups ($P < 0.0005$ for both wounds and granulomas).

In the granulomas the content of hydroxyproline and the lactic acid production in vitro increased, but the concentrations of hemoglobin and hexosamine decreased with the rising concentration of oxygen. Neither the total activity nor the electrophoretic pattern of lactic acid dehydrogenase-isoenzymes were affected. The maximal proline-hydroxylating activity (Juva, K.: these abstracts) was observed in granulomas from the rats exposed to 18 % O_2 and the largest DNA and RNA concentrations in granulomas from rats kept in 35 % O_2 .